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(54) Title: PESTICIDAL FORMULATIONS

(57) Abstract

Insecticide compositions are in unit dose packages, the package being soluble or dispersible in water. Preferably the insecticidal active ingredient is a solid pyrethroid, e.g. deltamethrin.

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Pesticidal Formulations.

THIS INVENTION relates to insecticides, particularly pesticides for the treatment of animals.

When dipping animals, such as cattle and sheep, the animals are dipped in an aqueous dip emulsion or suspension containing insecticides. As each animal passes through the dip, it removes a portion of the wash containing the insecticide. The amount removed by each animal varies generally between 0,05 gram and 7,5 grams. The insecticides used are generally organo-chlorine compounds, organo-phosphates, formamidines and pyrethroids. These insecticides are generally formulated as emulsifiable concentrates, wettable powders or suspension concentrates. These formulations are usually measured out in the field by the farmer and diluted with water before dipping or spraying.

The invention concerns a suitable form of such insecticides, and which avoids handling by the farmer of highly toxic insecticides.

The present invention provides a new composition of matter comprising a predetermined amount of a multiple unit dose of an insecticidally active compound in a package form,

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said package form being soluble in water. The insecticide conveniently may be a solid insecticide. A multiple unit dose is an amount of insecticide which is calculated to be used for treating a multiple number of animals.

The package form may be a water-soluble sachet, tablet, capsule, or the like. Gelatin or polyvinyl alcohol may be used for forming a capsule or sachet. The insecticide may be present in the package as a finely milled dispersible powder (eg of a size below 10 μ), a wettable powder, or the like.

Any suitable insecticide can be used, particularly a pyrethroid insecticide. An example is DELTAMETHRIN. Some of these pyrethroid insecticides are highly active and dipping or spraying at 0,0025% or less has been found to be sufficient for providing protection for many types of animals against external parasites, such as insects, ticks, flies, fleas, cattle mange mites, lice, sheep scab, goat mange, or the like. The composition may contain sufficient multiple dose for dipping from about 50 to 120 cattle, eg for dipping about 100 cattle of average size.

The insecticide may also be mixed with a dispersing agent (for example the sodium salt of oxylignin, or a sodium naphthalene sulphonate/formaldehyde condensation product), a wetting agent and/or an anti-frothing agent. Examples of wetting agents are nonylphenol ethylene oxide/propylene oxide condensates and/or sodium diisopropyl naphthalene sulphonate. A suitable anti-frothing agent is a silicone/water emulsion.

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The insecticide may make up from 10 to 90%, more usually about 30 to 60% of the composition. The dispersing agent can be present in amounts varying from less than that of the insecticide to more than that of the insecticide. Amounts of from 10 to 60% of dispersing agent have been found to be suitable.

Anti-frothing agents may be present in amounts of up to 1%, and wetting agents in amounts of up to 7% by weight of the composition.

The package form of the invention may be sold in any suitable size.

The invention also provides a method of making up an animal dip, particularly a dip for cattle or sheep, which comprises dissolving or suspending the composition of matter, as provided by the invention, in a predetermined amount of water.

The invention is illustrated in non-limiting manner by reference to the following Examples:

EXAMPLE 1

The following composition was made, up:

Deltamethrin Technical	47,7%
Dispersing agent ('TAMOL NNO')	47,7%
Anti-frothing agent ('SILCOLAPSE 5000A')	0,12%
Wetting agent (1) ('SYNPERONIC NPE 1800')	3,58%
Wetting agent (2) (Aerosol 'OS')	0,90%

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The above mixture was milled with water to a very fine particle size (1-5 μ) and dried. It was then packed into a water-soluble sachet. The sachets were made by heat-sealing together two layers of water-soluble polyvinyl alcohol film. The sachets, when added to a dipping tank, dissolved rapidly and released the 47,7% Deltamethrin dispersible powder which dispersed easily to form a very stable suspension.

Deltamethrin can be irritant to humans. The use of the capsule avoided handling of the insecticide by the user, such as a farmer:

EXAMPLE 2

Method of filling and replenishing cattle-dipping tanks.

15 000 litres of clean water were pumped into an empty dipping tank. 750 grams of 47,7% Deltamethrin dispersible powder packed in 7 x 100 gram sachets and 1 x 50 grams sachets, were added to the water to give a dilution of 0,0025% active ingredient. The sachets dissolved rapidly and released the insecticide. 400 Cattle were dipped. The following week, water was added until the water level reached the 15 000 litres mark. 4 x 12 grams (ie 12 g per 100 head) sachets of the 47,7% Deltamethrin were added to the dipping tank and the animals were again dipped. The following week, the same procedure was followed. After 16 weeks, the dipwash 'behaviour' was still satisfactory. The weekly dipwash concentration was found to vary between 0,0025 to 0,003% Deltamethrin. No adverse



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reaction was experienced by the farmer when using this product during the entire period. Tick control was excellent.



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HAVING NOW particularly described and ascertained our said invention and in what manner the same is to be performed, we declare that what we claim is:

1. A new composition of matter comprising a predetermined amount of a multiple unit dose of an insecticidally active compound in package form, said package form being soluble in water.
2. A composition as claimed in Claim 1, in the form of a sachet.
3. A composition as claimed in Claim 1, in the form of a capsule.
4. A composition as claimed in Claim 1, in the form of a tablet.
5. A composition as claimed in any of the preceding claims, wherein the insecticidally active compound is a pyrethroid insecticide.
6. A composition as claimed in Claim 5, wherein the insecticidally active compound is deltamethrin.
7. A composition as claimed in any of the preceding claims, wherein the composition contains sufficient insecticidally active compound for dipping from 50 to 120 cattle.

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8. A composition as claimed in any of the preceding claims, wherein the insecticidally active compound is mixed with one or more dispersing agents and/or anti-frothing agents and/or wetting agents.
9. A new composition of matter, substantially as described.
10. A method of making up an animal dip, which comprises dissolving or suspending a composition of matter as claimed in any of the preceding claims, in a predetermined amount of water.
11. A method as claimed in Claim 10, substantially as described.



INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 82/00031

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all):

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC³: A 01 N 25/34; A 01 N 53/00

II. FIELDS SEARCHED

Minimum Documentation Searched⁴

Classification System	Classification Symbols
IPC ³	A 01 N 25/34; A 01 N 53/00

Documentation Searched other than Minimum Documentation
to the Extent that such Documents are Included in the Fields Searched⁵III. DOCUMENTS CONSIDERED TO BE RELEVANT¹⁴

Category ⁶	Citation of Document, ¹⁵ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
X	US, A, 3877928 (W.A. HOUSTON) 15 April 1975 see the entire document --	1-11
X	US, A, 3556765 (W.A. HOUSTON) 19 January 1971 see the entire document --	1-11
X	GB, A, 922317 (ASSOCIATED FUMIGATORS) 27 March 1963 see the entire document --	1-11
X	GB, A, 13504A.D.1911 (R. BERK) 6 June 1912 see page 1, lines 10-20 --	1-11
X	FR, A, 1263098 (E. ROSSINI) 24 April 1961 see the entire document -----	1-11

¹⁵ Special categories of cited documents:

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¹⁶ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention¹⁷ document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step¹⁸ document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art¹⁹ document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search²⁰

27th April 1982

Date of Mailing of this International Search Report²¹

11th May 1982

International Searching Authority²²

EUROPEAN PATENT OFFICE

Signature of Authorized Officer²³G.L.N. *[Signature]* Rosenberg